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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
KIM, CHONG R	

ART UNIT	PAPER NUMBER
2624	

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03/12/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/586,869	HARMAN, PHILIP VICTOR	
	Examiner	Art Unit	
	CHARLES KIM	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,11,13,14,19-22,27-33 and 43-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,11,13,14,19-22,27-33 and 43-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 June 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 3, 2010 has been entered.

Response to Amendment and Arguments

2. Applicant's amendment filed on February 3, 2010 has been entered and made of record.

3. Applicant's arguments have been fully considered, but they are not deemed to be persuasive for at least the following reasons.

Applicant argues that their claimed invention (claims 27 and 46) differs from the prior art because Kawabata does not disclose determining depth information for a plurality of objects. (Response, pp. 5-6). Moreover, Applicant alleges that Kawabata fails to disclose "allocating a depth for each object, the depth representing the relative depth between said objects." (*Id.*). The Examiner disagrees.

Although figures 2A-2E illustrate an example of identifying a *single* object, Kawabata's depth map encoding method is not limited as such. Instead, a plurality of objects can be identified, as evidenced by Kawabata's disclosure of obtaining object information comprising a number of persons (see col. 3, ll. 13-15). Kawabata also illustrates a plurality objects to be

processed in figures 6A1, 6B1, and 6C1. Accordingly, Kawabata's depth map encoding method is clearly applicable not only to a single object, but also to multiple objects.

In applying Kawabata's depth map encoding method to multiple objects, the Examiner notes that depth information for each object will be determined. By determining depth information for each object, the relative depth between the objects will also be determined. For example, when one object is determined to have a depth of 3 and the other object is determined to have a depth of 5, the relative depth between them is 2. As such, determining depth information for each object will necessarily determine the relative depth between the objects. Therefore, contrary to what Applicant contends, Kawabata discloses "allocating a depth for each object, the depth representing the relative depth between said objects," as recited in claims 27 and 46.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 27 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, U.S. Patent No. 6,370,262 ("Kawabata") and Sfarti et al., U.S. Patent No. 5,789,762 ("Sfarti").

Referring to claim 27, Kawabata discloses a method of encoding a depth map including:

a. allocating an object identifier (address) to a plurality of objects without using distance measurement data [col. 6, lines 37-53. See also arguments above and col. 3, ll. 13-15, figs. 2 and 6.];

b. allocating a depth tag to each object, including allocating a depth function, and allocating a depth for each object, the depth representing the relative depth between the objects [col. 5, ll. 8-14 and col. 6, lines 21-24 and figure 2B. Note that the distance calculation method is construed as a depth function. See also arguments above and col. 3, ll. 13-15, figs. 2 and 6.];

c. defining an outline (contour) of each object [col. 6, lines 40-53]; and

d. producing a depth map by encoding the depth tag and the outline of each object [col. 6, lines 19-53. Note that the depth map in figure 2C is generated by encoding the depth tag (distance data) and the outline (contour) of the object. See also arguments above and col. 3, ll. 13-15, figs. 2 and 6.];

wherein the steps of allocating the object identifier, allocating the depth tag and defining the outline are performed by a computer [fig. 1].

Kawabata does not explicitly disclose that the depth function includes a linear ramp or a radial ramp. However, this feature was well known in the art. For example, Sfarti discloses a depth function that includes a linear ramp [col. 5, ll. 17-23; "*w is a linear function of depth*."].

Kawabata and Sfarti are combinable because they are both concerned with image processing methods based on depth data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Kawabata in view of Sfarti's teachings. The reason for doing so would have been to enhance the depth map by implementing a linear

ramp. Therefore, it would have been obvious to combine Kawabata with Sfarti to obtain the invention as specified in claim 27.

Referring to claim 46, see the rejection of at least claim 27 above.

5. Claims 27, 2, 13, 14, 19-22, 32-33, 43-44, 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, U.S. Patent No. 6,370,262 ("Kawabata") and the article entitled "A Fast Linear Shape From Shading" by Tsai et al., ("Tsai").

Referring to claim 27, Kawabata discloses a method of encoding a depth map including:

a. allocating an object identifier (address) to a plurality of objects without using distance measurement data [col. 6, lines 37-53. See also col. 3, ll. 13-15, figs. 2 and 6, which suggests that the depth map encoding can be applied to multiple objects.];

b. allocating a depth tag to each object, including allocating a depth function, and allocating a depth for each object, the depth representing the relative depth between the objects [col. 5, ll. 8-14 and col. 6, lines 21-24 and figure 2B. Note that the distance calculation method is construed as a depth function. See also col. 3, ll. 13-15, figs. 2 and 6 and arguments above.];

c. defining an outline (contour) of each object [col. 6, lines 40-53]; and

d. producing a depth map by encoding the depth tag and the outline of each object [col. 6, lines 19-53. Note that the depth map in figure 2C is generated by encoding the depth tag (distance data) and the outline (contour) of the object. See also col. 3, ll. 13-15, figs. 2 and 6.];

wherein the steps of allocating the object identifier, allocating the depth tag and defining the outline are performed by a computer [fig. 1].

Kawabata does not explicitly disclose that the depth function includes a linear ramp or a radial ramp. However, this feature was well known in the art. For example, Tsai discloses a depth function that includes a linear ramp [p. 734-735, section 1, "*the linearity of the reflectance map in the depth Z...results in a better depth map.*"]

Kawabata and Tsai are combinable because they are both concerned with depth maps. Tsai explains that using a linear ramp results in a better and faster depth map [p. 735]. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Kawabata to include Tsai's linear ramp. The reason for doing so would have been to obtain the predictable result of a better and faster depth map. Therefore, it would have been obvious to combine Kawabata with Tsai to obtain the invention as specified in claim 27.

Referring to claim 2, Kawabata further discloses that the object outline is defined by a series of coordinates [col. 6, lines 44-48].

Referring to claim 13, Kawabata further discloses that the depth tag is a numerical value [col. 6, lines 18-24 and figure 2B].

Referring to claim 14, Kawabata further discloses that the numerical value ranges from 0 to 255 [col. 6, lines 21-24 and figure 2B].

Referring to claims 19-20, Kawabata further discloses adding a texture bump map to the object, wherein the texture bump map is defined by breaking the at least one object into a plurality of components and assigning a separate depth tag [fig. 2b. Note that the object is broken into a plurality of components and assigned a separate depth tag.].

Referring to claims 21-22, Kawabata does not explicitly disclose that the texture bump map is defined by luminance values of individual components of the at least one object or by

chrominance, saturation, color grouping, reflections, shadows, focus, and/or sharpness of individual components. However, Official Notice is taken that these types of texture bump maps were well known in the art. Therefore, it would have been obvious to modify Kawabata's method to include a texture bump map, as described above, in order to provide the user with additional information relating to the object.

Referring to claim 32, Kawabata further discloses that the object outline is defined by at least one geometric shape [figure 2C].

Referring to claim 33, Kawabata further discloses that the geometric shape is defined by the form of the shape and the parameters of the shape [col. 6, lines 31-53].

Referring to claims 43 and 44, Kawabata further discloses a method of converting 2D images into stereoscopic images applying a depth map generated above (claim 27) [col. 5, lines 8-15, col. 6, lines 18-64].

Referring to claim 46, see the rejection of at least claim 27 above.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, Tsai, and Nourbakhsh et al., U.S. Patent No. 5,793,900 ("Nourbakhsh.").

Referring to claim 11, Kawabata does not disclose that the depth tag includes a color code. However, this feature was exceedingly well known in the art. For example, Nourbakhsh discloses generating categorical depth maps using passive defocus sensing wherein a depth map is an array of categorical depth values, each value indicating the depth of the scene for a given region such that depth values of 2, 1, and 0 correspond to close, medium, and far, respectively [column 5, line 9-15]. Nourbakhsh further discloses that close regions are lightly shaded,

medium regions are medium shaded, and far regions are darkly shaded [Figures 2-7; column 5, line 20-25]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent objects relatively close to the viewer as white and objects relatively distant from the viewer with black, as taught by Nourbakhsh. The reason for doing so would have been to give the viewer an impression of depth using varying pixel intensities taking into account that brighter areas logically indicate a closer portion, which is easier to see, and darker areas indicate a distant portion, which is more difficult to see [Nourbakhsh, column 5, line 20-31].

7. Claims 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, Tsai, and Meek et al. U.S. Patent No. 6,029,173 ("Meek").

Referring to claim 28, Kawabata does not explicitly disclose that the object outline is defined by a series of x, y coordinates, each x, y coordinate being separated by a curve. However, this feature was exceedingly well known in the art. For example, Meek discloses an object outline that is defined by a series of x, y coordinates, each x, y coordinate being separated by a curve [figure 5]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include an object outline defied by x, y coordinates separated by a cruve, as taught by Meek. The reason for doing so would have been to approximate the outline and minimize the storage requirements while providing a high level of accuracy in the representation of other-than-straight (curved) features [Meek, column 4, line 32-46].

Referring to claim 29, Meek discloses further that each curve (other-than-straight segment) is stored in a library and allocated a unique numerical number (index reference value) [column 8, line 60-64].

Referring to claim 30, Meek further discloses that the object outline also includes data on the orientation (rotation) of each curve [column 8, line 50-64].

Referring to claim 31, Meek discloses that each curve is a Bezier curve [column 6, line 14-30].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 571-272-7421. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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